

## PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION  
(PCT Rule 61.2)Date of mailing (day/month/year)  
10 November 2000 (10.11.00)To:  
Commissioner  
US Department of Commerce  
United States Patent and Trademark  
Office, PCT  
2011 South Clark Place Room  
CP2/5C24  
Arlington, VA 22202  
ETATS-UNIS D'AMERIQUE  
in its capacity as elected OfficeInternational application No.  
PCT/GB00/01127Applicant's or agent's file reference  
DJC/DMB/S136International filing date (day/month/year)  
24 March 2000 (24.03.00)Priority date (day/month/year)  
25 March 1999 (25.03.99)

## Applicant

CONNOLLY, Christine et al

1. The designated Office is hereby notified of its election made: in the demand filed with the International Preliminary Examining Authority on:

16 September 2000 (16.09.00)

 in a notice effecting later election filed with the International Bureau on:2. The election  was was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO  
34, chemin des Colombelettes  
1211 Geneva 20, Switzerland

Authorized officer

Zakaria EL KHODARY

Facsimile No.: (41-22) 740.14.35

Telephone No.: (41-22) 338.83.38

## PATENT COOPERATION TREATY

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REC 24 APR 2001

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## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference DJC/DMB/S136	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/GB00/01127	International filing date (day/month/year) 24/03/2000	Priority date (day/month/year) 25/03/1999
International Patent Classification (IPC) or national classification and IPC G01J3/50		
Applicant COLOUR VALID LIMITED et al.		
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p><input type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of sheets.</p>		
<p>3. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> <li>I <input checked="" type="checkbox"/> Basis of the report</li> <li>II <input type="checkbox"/> Priority</li> <li>III <input checked="" type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</li> <li>IV <input checked="" type="checkbox"/> Lack of unity of invention</li> <li>V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</li> <li>VI <input type="checkbox"/> Certain documents cited</li> <li>VII <input type="checkbox"/> Certain defects in the international application</li> <li>VIII <input checked="" type="checkbox"/> Certain observations on the international application</li> </ul>		

Date of submission of the demand 16/09/2000	Date of completion of this report 20.04.2001
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Artelsmair, G Telephone No. +49 89 2399 8989



**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/GB00/01127

**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):  
**Description, pages:**

1-30 as originally filed

**Claims, No.:**

1-30 as originally filed

**Drawings, sheets:**

1-7 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- the language of publication of the international application (under Rule 48.3(b)).
- the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- contained in the international application in written form.
- filed together with the international application in computer readable form.
- furnished subsequently to this Authority in written form.
- furnished subsequently to this Authority in computer readable form.
- The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- the description, pages:
- the claims, Nos.:

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/GB00/01127

the drawings, sheets:

5.  This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):  
*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

the entire international application.

claims Nos. 16-30.

because:

the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):

the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):

the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

no international search report has been established for the said claims Nos. 16-30.

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

the written form has not been furnished or does not comply with the standard.

the computer readable form has not been furnished or does not comply with the standard.

**IV. Lack of unity of invention**

1. In response to the invitation to restrict or pay additional fees the applicant has:

restricted the claims.

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/GB00/01127

- paid additional fees.
- paid additional fees under protest.
- neither restricted nor paid additional fees.

2.  This Authority found that the requirement of unity of invention is not complied and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

- complied with.
- not complied with for the following reasons:

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

- all parts.
- the parts relating to claims Nos. 1-15.

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes: Claims 1-15
	No: Claims
Inventive step (IS)	Yes: Claims
	No: Claims 1-15
Industrial applicability (IA)	Yes: Claims 1-15
	No: Claims

2. Citations and explanations  
**see separate sheet**

**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:  
**see separate sheet**

**1 CONCERNING ITEM IV:**

This authority agrees to the objection on lack of unity brought forward by the International Searching Authority.

**2 CONCERNING ITEM V:**

2.1 US-A-5589880 (D1) describes a method of calibrating a colour monitoring system so as to compensate for non-ideal real camera characteristics, the method comprising:  
establishing a "knee", i.e. the point at which a graph of input light intensity against camera output voltage starts to deviate from a substantially linear characteristic (saturation level  $I_s$ ); and  
restricting the amount of light incident on the sensor elements of the camera such that the light intensities are within the range of linear operation (see column 1, line 15 to column 2, line 53).

D1 does not explicitly mention establishing a camera offset. However, determining an offset value in an electronic camera is well known in the prior art, see for example US-A-5038369 (D2) or US-A-5267053 (D3). It would be a matter of normal design procedure for a skilled person to include such an offset determining step in the method of D1 if there is any need to do so.

Thus the subject-matter of claim 1 does not involve an inventive step.

2.2 Basically, what the method according to claim 1 attempts to achieve is to keep the camera in the linear operation range by controlling the camera iris. This is the normal way of operating a camera and this has already been applied in the age of cameras based on photographic film. As an electronic sensor, the intensity response graph of photographic film has an offset and a knee, i.e. the saturation level. And as for electronic cameras, "traditional" cameras were kept in the linear response range of the photographic film by restricting the amount of light incident

on the film (by controlling the iris and/or the exposure time). Thus, what claim 1 defines is the very general knowledge of a skilled person in the technical field. Consequently, also under this aspect, claim 1 does not meet the requirements of Article 33(3) PCT.

2.3 The dependent claims do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step.

**3 CONCERNING ITEM VIII:**

Claim 1 defines a method of calibrating a colour monitoring system of a camera whereby a camera offset is established, a knee point of the response function is established, and the operation condition of the camera is set such that the camera sensor is kept in its linear range.

Claim 1 is silent as to how the knee point is established.

Claim 1 is silent as to how the amount of light incident on the sensor is restricted.

Claim 1 is silent as to what the reason for establishing the camera offset is. It does not mention any kind of offset compensation (it is not even clear that the description does mention this), nor does it describe any other use of the established offset. In this context it should be noted that the camera works in a linear range of operation even if an offset is present. The offset only means that the linear function does not pass through the origin.

Thus independent claim 1 does not meet the requirement following from Article 6 PCT taken in combination with Rule 6.3(b) PCT since it does not contain all the technical features essential to the definition of the invention.

PATENT COOPERATION TREATY  
PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>DJC/DMB/S136</b>	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. <b>PCT/GB 00/ 01127</b>	International filing date (day/month/year) <b>24/03/2000</b>	(Earliest) Priority Date (day/month/year) <b>25/03/1999</b>
Applicant <b>COLOUR VALID LIMITED et al.</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
  - the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).
- b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing :
  - contained in the international application in written form.
  - filed together with the international application in computer readable form.
  - furnished subsequently to this Authority in written form.
  - furnished subsequently to this Authority in computer readable form.
  - the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
  - the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2.  Certain claims were found unsearchable (See Box I).

3.  Unity of invention is lacking (see Box II).

4. With regard to the title,

- the text is approved as submitted by the applicant.
- the text has been established by this Authority to read as follows:

**METHOD FOR CALIBRATING A CAMERA IN A COLOUR MONITORING SYSTEM**

5. With regard to the abstract,

- the text is approved as submitted by the applicant.
- the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.

- as suggested by the applicant.
- because the applicant failed to suggest a figure.
- because this figure better characterizes the invention.

1

None of the figures.

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 00/01127

A. CLASSIFICATION OF SUBJECT MATTER  
 IPC 7 G01J3/50 H04N5/217

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
 IPC 7 G01J H04N G01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 038 369 A (NISHIKI MASAYUKI) 6 August 1991 (1991-08-06) abstract ---	1
A	US 5 221 963 A (HASHIMOTO NOBUO ET AL) 22 June 1993 (1993-06-22) column 5, line 50 -column 7, line 17; claim 1 ---	1-3,10, 11
A	US 5 589 880 A (TSUKUI AKIMI) 31 December 1996 (1996-12-31) column 1, line 15 -column 2, line 53 ---	1
A	US 5 267 053 A (POTUCEK MARTIN ET AL) 30 November 1993 (1993-11-30) abstract -----	1,5,8,9

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

## ° Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

Date of mailing of the international search report

20 July 2000

27.10.00

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patenttaan 2  
 NL - 2280 HV Rijswijk  
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
 Fax: (+31-70) 340-3016

Authorized officer

De Buyzer, H

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/GB 00/01127

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:
  
2.  Claims Nos.: because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
  
3.  Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet(s)

1.  As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
  
2.  As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
  
3.  As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
  
4.  No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-15

### Remark on Protest

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

**1. Claims: 1-15**

a method for periodical calibration of a camera

**2. Claims: 16-22**

a method for compensating for non-uniform lighting across the field of view of a camera

**3. Claims: 23-30**

a method for monitoring the colour of moving material, involving measurement of the displacement specific areas of an image before performing colour calculations.

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 00/01127

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
US 5038369	A	06-08-1991		JP 1870560 C		06-09-1994
				JP 2164184 A		25-06-1990
				JP 5084107 B		30-11-1993
<hr/>						
US 5221963	A	22-06-1993		JP 3285470 A		16-12-1991
				JP 2990732 B		13-12-1999
				JP 3285471 A		16-12-1991
				JP 2990733 B		13-12-1999
				JP 3285469 A		16-12-1991
				JP 3285477 A		16-12-1991
				JP 3289274 A		19-12-1991
<hr/>						
US 5589880	A	31-12-1996		JP 7212645 A		11-08-1995
<hr/>						
US 5267053	A	30-11-1993		DE 68916011 D		14-07-1994
				DE 68916011 T		05-01-1995
				EP 0396708 A		14-11-1990
				JP 3501916 T		25-04-1991
				WO 9004900 A		03-05-1990
<hr/>						

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
5 October 2000 (05.10.2000)

PCT

(10) International Publication Number  
**WO 00/58698 A3**

(51) International Patent Classification?: **G01J 3/50, H04N 5/217**

Andrew [GB/GB]; 2 Pasture Close, Clayton, Bradford, West Yorkshire BD14 6LY (GB).

(21) International Application Number: **PCT/GB00/01127**

(74) Agents: **CHUGG, David, John et al.**; Appleyard Lees, 15 Clare Road, Halifax HX1 2HY (GB).

(22) International Filing Date: **24 March 2000 (24.03.2000)**

(81) Designated State (national): **US.**

(25) Filing Language: **English**

(84) Designated States (regional): European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).

(26) Publication Language: **English**

Published:  
— *With international search report.*

(30) Priority Data:  
9906765.4 25 March 1999 (25.03.1999) GB

(88) Date of publication of the international search report:  
22 February 2001

(71) Applicant (for all designated States except US):

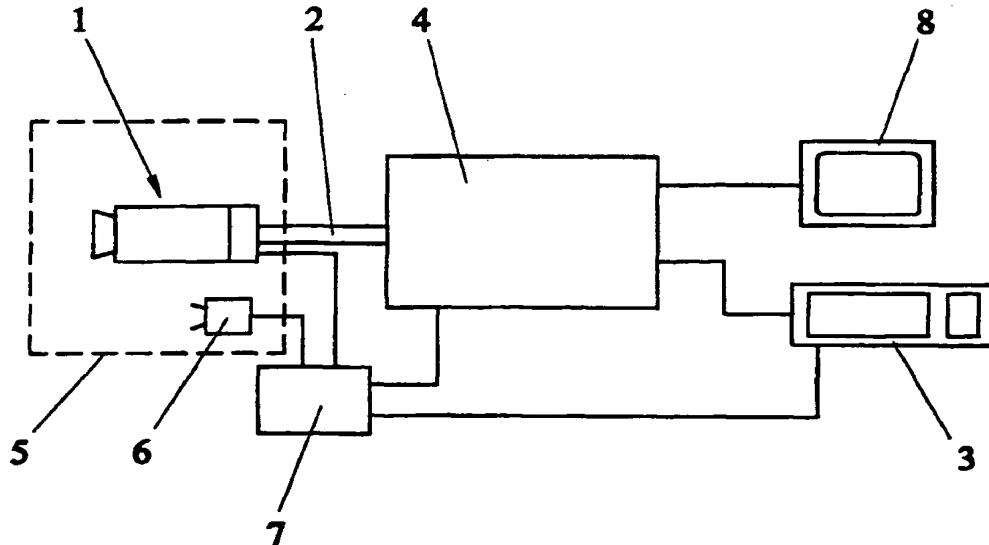
**COLOUR VALID LIMITED [GB/GB]; Campus House, 10 Hey Street, Bradford, West Yorkshire BD7 1DQ (GB).**

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(72) Inventors; and

(75) Inventors/Applicants (for US only): **CONNOLLY, Christine [GB/GB]; 64 Stocks Way, Shepley, Huddersfield, West Yorkshire HD8 8DN (GB). FOWLER, James,**

**WO 00/58698 A3**



(57) Abstract: The invention concerns colour monitoring and particularly relates to a method of calibrating a colour monitoring system, to compensate for non-ideal camera characteristics, a method of compensating for non-uniformity of lighting across a camera field of view and a method for the capture and analysis of image data of a moving material. The basic colour monitoring apparatus comprises a camera (1), an associated camera interface with bus (2), a processor such as a personal computer (3), an image capture board (4), a lighting box (5), a flash lighting source (6), a trigger circuit (7) and a monitor (8).

**FOR THE PURPOSES OF INFORMATION ONLY**

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
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DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		

## INTERNATIONAL SEARCH REPORT

International Application No

PC, GB 00/01127

A. CLASSIFICATION OF SUBJECT MATTER  
 IPC 7 G01J3/50 H04N5/217

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
 IPC 7 G01J H04N G01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

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\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

\*&\* document member of the same patent family

Date of the actual completion of the international search

Date of mailing of the international search report

20 July 2000

27.10.00

## Name and mailing address of the ISA

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 Fax: (+31-70) 340-3016

## Authorized officer

De Buyerer, H

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/GB 00/01127

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:
  
2.  Claims Nos.: because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
  
3.  Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

**see additional sheet(s)**

1.  As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
  
2.  As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
  
3.  As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
  
  
4.  No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-15

### Remark on Protest

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

**1. Claims: 1-15**

a method for periodical calibration of a camera

**2. Claims: 16-22**

a method for compensating for non-uniform lighting across the field of view of a camera

**3. Claims: 23-30**

a method for monitoring the colour of moving material, involving measurement of the displacement specific areas of an image before performing colour calculations.

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 00/01127

Patent document cited in search report	Publication date	Patent family member(s)			Publication date
US 5038369	A 06-08-1991	JP 1870560	C	06-09-1994	
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